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MOSS USER'S MANUAL

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1.0 WHAT IS MOSS?

MOSS IS A SPECIFIC SYSTEM: MOSS has been designed to allow non-technical users to retrieve, spatially analyze, and display map data stored in a MOSS map data base.

MOSS HAS MANY POTENTIAL APPLICATIONS: MOSS has direct potential for use by international, federal, state, or local government agencies and private firms MOSS can be used for such projects as resource policy planning, regional energy development, impact analysis, local environmental impact statements (EIS), power plant siting, wildlife habitate evaluation, refuge or forestry master-planning, or industrial siting. Each of these applications have specific data and spatial analysis requirements which will not be discussed on this User's Manual.

SIX MOSS SUBSYSTEMS: MOSS can be thought of in terms of six interconnected components as diagrammed in Figure 1.2.A:

1) a trained user at a graphics terminal
2) a user-language processor
3) a data base management subsystem
4) a data analysis subsystem
5) a data display subsystem
6) a data input subsystem

THE USER: The first and most important component of MOSS is a trained user. This user issues commands to MOSS via a terminal. The system interacts with the user by asking for commands and then prompting the user for additional information. By skillful use of MOSS commands, a user can perform a large number of powerful functions to analyze spatial data.

USER-LANGUAGE PROCESSOR: The second subsystem of MOSS is the user-language processor. The user-language processor:

1) interprets each command issued by the user to determine the validity of the syntax and vocabulary;

2) edits user commands and prompts the user for options and parameters which have not been specified by the user;

3) issues diagnostic messages when errors are detected.

DATA BASE MANAGEMENT SUBSYSTEM: The third subsystem is the data base management subsystem (DBMS). This sub-system allows a user to browse the data base for data of particular interest. Once the data of interest have been found, the user can subset the data base by using nominal or spatial criteria to activate only those data required to solve a particular problem. The user may also archive data at anytime. The DBMS keeps track of the size and location of all stored data and produces summary information regarding stored map data.

THE DATA ANALYSIS SUBSYSTEM: The fourth subsystem is the data analysis subsystem. This allows the user to spatially analyze one or more maps in vector or raster format. The length, area, or distance characteristics of any one map can be determined, as well as the logical intersection between any two maps. This subsystem performs approximately sixteen "workhorse" functions, including both spatial retrieval and analysis capabilities.

DATA DISPLAY SUBSYSTEM: The fifth subsystem is the data display subsystem. This subsystem produces plots, bar graphs, and tabular listings. A variety of output display devices is available, including a graphics hardcopy unit, a drum plotter, and/or a line printer.

DATA INPUT INTERFACES: The sixth subsystem is a series of computer programs which operate independently of the user language processor. These programs function as data input interfaces and allow a systems analyst to convert previous digitized map data from an external format to the standard MOSS data base management system format. This subsystem is usually not operated by the user and requires a highly trained MOSS user for many of the more sophisticated data transfers.

1.1 Audience for this Manual

MANUAL OBJECTIVE: The MOSS User's Manual has been designed as a reference document aimed at an audience ranging from semi-trained to highly-skilled MOSS users. This Manual contains all information necessary for a trained user to access and use the MOSS system. The Manual has been designed to be easily updated, so that entire sections, or individual page can be replaced with corrections.

READER PREREQUISITIES: It is assumed that the reader of this document has a certain familiarity with Geographic Information Systems and their applications. Specifically, it is assumed that the reader of this MOSS User's Manual:

1) is familiar with the broad concepts of Geographic Information Systems and is aware of GIS technology in general.

2) is aware of typical useful applications of GIS, e.g., statewide resource planning, regional energy development, impact analysis, change detection, surface modeling or resource inventory.

3) has defined his own particular GIS application in terms of data input and analysis requirements.

4) has digitized data available to solve his particular problem.

5) has access to the required MOSS software and hardware resources.

6) has undergone an introductory MOSS user training session.

REFERENCE MANUAL FOR TRAINED USERS: The MOSS User's Manual is intended as a reference guide for semi-trained or highly-skilled MOSS users. It is expected that after initial MOSS training a user will want to refer back to this Manual to review syntax rules and the detailed descriptions, parameters, and limitations of individual MOSS commands.

This Manual is:

1) not an introduction to the area of Geographic Information Systems.

2) not a primer on GIS applications.

3) not a detailed systems reference manual.

PREFACE

The Map Overlay and Statistical System (MOSS) User's Manual is a specialized document which has been designed for trained users of the MOSS interactive mapping software. Those totally familiar with MOSS Geographic Information Systems are referred to sections in this manual as described below:

-- If you know nothing about MOSS or what it can do for you and you wish introductory information on MOSS, if you want to design an application and data-entry process compatible with MOSS, or if you want "hands-on" training, start reading with the User's Manual Conventions.

-- If you have been introduced to MOSS, have an application defined, have data entered, and want to know how to use MOSS, start reading at Section 1 of this Manual.

-- If you are interested in MOSS data structures, refer to Section 2 of this Manual.

-- If you have some experience in using MOSS and want to refer to the general type of MOSS commands, read Section 3 of this Manual.

-- If you are an experienced MOSS user and want details on individual MOSS commands, refer to Section 5, 6, 7, 8, and 9 of this Manual.

MOSS USER'S MANUAL CONVENTIONS

The MOSS User's Manual incorporates a number of style conventions designed to promote clear communication and to simplify updating. These include:

1) Pagination — Pages are numbered consecutively within major sections. The major section number is given first, followed by a dash and the number of the page within that section.

   Updating will be done by issuing whole sections appropriately repaginated or by adding new pages.

2) Figure Numbering — Figures are given the number of the section in which they appear, followed by an upper case letter.

3) Embedded Examples -- Examples of MOSS output showing command sequences and other information appear throughout the text. These usually are indented and always appear in capitals.

4) References — References for reports cited in the text appear in Appendix E.

5) Bugs and inconsistencies -- Users finding bugs or inconsistencies in the text should report them to Autometric.

6) Acronymns — A variety of acronymns are used throughout the text. The acronymns and their definitions are listed on the following page.

ACRONYMS

AOS - Advance Operating System
COS - Cartographic Output System
CPU - Central Processing Unit
CRT - Cathode Ray Tube
DBMS - Data Base Management System
GIS - Geographic Information System
MOSS - Map Overlay and Statistical System
UTM - Universal Transverse Mercator

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2.0 ORGANIZATION OF DATA IN MOSS

The map data in MOSS is stored in a master file and two types of work-files, as depicted in Figure 2.1.A. The master file contains all the original digitized data for a project. Data in the master file is permanent and cannot be amended or deleted by users. Since only a portion of the data in the master file is ever needed to solve a specific problem, users must "activate or select" the data that will be needed for display and analysis. The data has been activated is referred to as active data. Active data that a user wished to save can be transferred to a workfile for future reference. Raster workfiles are used to store raster or Digital Elevation Data, while polygon workfiles are used to store polygon data. As with master file data, data stored in a workfile must be activated before it can be analyzed.

The following sections discuss in more detail the organization and structure of the MOSS master file and workfiles, the characteristics and use of active data, and the browsing, archiving and data retrieval characteristics of MOSS. Users should pay particular attention to terms that are underlined in this section. These terms appear throughout the text and will form the basis for understanding and using MOSS.

2.1 Master File

The master file (called MASTER.DT) is a "central library". The original digitized geograpic data in MOSS is stored in the master file. The master file is analogous to a central library that contains documents on a variety of topics. Generally, a separate master file exists for each project area. For example, maps that are digitized for the entire state of Wyoming might be stored in the master file named WYOMING.DT. While a separate set of digitized map data for Campbell County, Wyoming, might be stored in the master file named CAMPBELL.DT. This convention allows users to avoid data for study areas that are not of interest. Data bases are also physically separate so that data of different quality of resolution cannot be readily mixed. For example, maps suitable for a state analysis and campsite layout should not be mixed. However, when the user wishes to look at data from two overlapping or adjoining study areas, he can merge the data. To move from project to project the user utilizes the MOSS OPEN command.

2.2 Workfiles

A workfile is a working space for storing user derived data, such as that generated from a polygon overlay. Workfiles eliminate much of the time and expense required to recreate maps that will be used repetitively over a period of several days or weeks. Unlike maps in the master file, maps stored in the workfile can readily be added or deleted by users.

There are two types of workfiles — raster (cell) and polygon. The distinction is based on the way in which data is stored. Cell data is stored in a regular grid pattern, where each cell is the grid is given an identifying code based on its characteristic (Figure 2.2.A). To facilitate these analysis, the user can easily convert any polygon map in MOSS from a polygon to a cell format. The output from the commands that produce cellular data can be stored in a "cell workfile".

2.3 Active Data

Generally, only a portion of the data in the master file or workfile is ever needed to solve any given problem. Consequently, the user must select or "activate" the data that will be needed for display and analysis. (A map cannot be analyzed or displayed until it has been activated.) Activating data is very similar to retrieving documents from the shelves of a library for review and analysis. The user may activate data from both the master file and work file or synthesize data from existing maps. For examples of how to activate data, see Section 3.4.3.

Reference to the "active data" is maintained in an "active map ID table". Each entry in the table is given a unique identifying number. This number identifies the active map that a user wishes to analyze or display. For an example of the active map data table, see Section 6.1, ACTIVE command.

2.4 Browsing, Archiving/Dearchiving, and Retrieving Data

Associated with the master file is a hierarchical directory structure that allows uers to browse, archieve, dearchive and retrieve the map data stored in MOSS. Figure 2.4.A illustrates how a digitized map of Wyoming committed coal might be stored in a master file. Each map in a master file

has a map "name", "subjects", and "items". A unique 10 character name identifies each map. Each map has primary attributes or subjects: PCOAL, SCOAL, etc. Each polygon may also have many sub-attributes. Each polygon has a unique I.D. number The hierarchy associated with any map is a function of the inherent complexity of the map and the specifications provided by the users at the time the data was digitized.

The hierarchical design of the master file allows all or a specific portion of a map to be activated or retrieved. For example, at the map level, one specific or all subjects may be retrieved. This capability, greatly increases the efficiency of map data processing and allows the user to avoid unwanted detail or data.

Each master file map also has an assoiated "legend" containing information on the source, vintage, resolution, original scale, accuracy, and other characteristics of the digitized map. In general, the information on the map legend is useful for determining the suitability of a map for a particular analysis.

3.0 INTRODUCTION TO MOSS COMMANDS

MOSS contains commands or key words which, when typed in at a computer terminal, perform some kind of operation. Most of the commands allow users to monitor, retrieve, or manipulate the data stored in MOSS data files (see Section 2). Other commands provide tutorial information on how to use MOSS and how to finish or compute the cost of MOSS session.

After a user has connected to MOSS, the system will automatically prompt the user to:

```
ENTER COMMAND
?
```

Whenever this message appears, MOSS is requesting the user to type in a command.

The following chapter provides the user with an overview of MOSS. The topics covered include the general groups and capabilities of MOSS commands, the syntax rules and terminology associated with the commands, and the basic sequence for entering commands.

3.1 Groups of MOSS Commands

COMMAND GROUPS: There are five functional grops of MOSS commands: (1) general purpose; (2) data base management; (3) spatial retrieval; (4) analysis; and (5) display commands. The following sections discuss the general capabilities and uses of each of the groups.

3.1.1 General Purpose Commands

The general purpose commands are a group of commands that perform a variety of unrelated functions. They provide the capability to (1) determine the geographic coordinates of any point on the display screen (i.e.,

CRT), (2) identify an item on the CRT display screen, (3) terminate a MOSS run, (4) obtain assistance at any point during a session, (5) determine the cost of a session, and (6) obtain information on any changes to the system. The general purpose commands are: AUDIT, COST, FINISH, HELP, LOCATE, NEWS, and QUERY.

3.1.2 Data Base Management Commands

The data base management commands provide the capability to access and manipulate the map data base in MOSS. Specifically, the data base management commands can be used to: (1) browse the contents of the data base at different levels of detail; (2) activate maps or portions of maps that are needed for analysis or display; (3) change vector maps from raster form; (4) save maps for future reference; (5) merge maps from adjoining areas into one map; and (6) create an independent data base for a study area whose boundary is user-specified. Examples of the data base management commands (assuming the appropriate data are stored in MOSS) are:

EXAMPLE USES:

1) list of names of the maps stored in MOSS that cover the state of Wyoming.

2) describe the source, resolution, vintage, and digitizing quality of a particular map, such as the antelope range map of Wyoming.

3) list of types of antelope range (e.g., winter, summer, etc.) that are depicted on the antelope range map.

4) retrieve or activate only the antelope winter range habitat from the Wyoming antelope range map.

5) list and describe all the maps that have been activated.

6) convert the antelope range map into a cell map with a cell size of 150 acres.

COMMANDS: The data base management commands in MOSS include: ACTIVE, ADD, ARCHIVE, COMPRESS, DEARCHIVE, DELETE, FREE, LIST, MERGE, OPEN, POLYCELL, REPORT, SAVE, SELECT, STATUS, and STUDYAREA.

3.1.3 Spatial Retrieval Commands

The spatial retrieval commands retrieve data from the MOSS data files based upon a spatial characteristic of the map data. For example, the spatial retrieval commands in MOSS perform the following types of tasks (assuming the appropriate data in the system):

EXAMPLE USES:

1) find all the critical antelope winter range areas within 2 miles of a specific surface mine.
2) find all the critical antelope winter range areas within 2 miles of all proposed surface mines.
3) find all the strippable coal deposits greater than 5,000 acres and less than 10,000 acres.
4) find all the areas where sage brush is adjacent to ponderosa pine.
5) find all the edges or ecotones where sage brush is adjacent to ponderosa pine.

COMMANDS: MOSS spatial retrieval commands are: CONTIGUITY, EDGE, PROXIMITY, and SIZE.

3.1.4 Analysis Commands

The largest group of commands in MOSS is the analysis commands. In essence, the analysis commands provide the user with the capabilities to do something with MOSS map data. For example, the analysis commands could be used to answer the following questions (assuming the appropriate data were in the system):

POSSIBLE USES:

1) Given a proposed land use type and related site criteria, which sites in the study area are most suitable? (This is similar to the manual overlay techniue of suitability mapping popularized by Ian McHarg in "Design with Nature" Doubleday/Natural History Press, Garden City, N.Y., 1969)'.

2) How many miles of second-order streams are there in Senate District 10?

3) How many types of wildlife habitat are in the study area and what is the total number of acres for each?

4) Where are all areas in Region 6 that have vegatation type X that are at elevations greater than 5,000 ft.?

5) How far downstream is point "X" from point "Y"?

There are three major types of analysis commands. "Measurement" commands facilitate the calculation of area, straight line distance, distance along an irregular line, and perimeters. These commands include AREA, DISTANCE, PERIMETER, FREQUENCY, and LENGTH. "Statistical" commands are available to produce one and two way frequency tables, construct histograms, and calculate the mean, variance, and standard deviation of map variables. The statistical commands in MOSS are SAMPLE, STATISTICS (CROSSTABS), STATISTICS (DESCRIBE), STATISTICS (HISTOGRAM), and SPSS. "Synthesis" commands are those which combine or manipulate several maps to create new or synthetic maps. The synthesis commands include: COMPOSITE, BUFFER, GRID, LPOVER, OVERLAY, POINTOVER, ASPECT, SLOPE, and PROFILE.

3.1.5 Display Commands

Display commands are available to display any map in MOSS on several output devices including a graphics display (CRT) terminal, plotter, and a line printer. These commands also provide the capability to display maps at any scale, place legends on maps, label map features, and graphically represent map features with different symbols. Figures 3.1.5.A and 3.1.5.B show examples of two comman types of MOSS output: (1) plotter output and (2) graphics display (CRT) output. Depending on the analysis being performed, the user can select the most appropriate output medium.

COMMANDS: The display commands in MOSS include: BLOWUP, CALCOMP, CELLPLOT, CELLVERS, ERASE, LEGEND, LINE, NUMBER, PLOT, RESET, SHADE, SYMBOL, TESTGRID, THREED, WINDOW, WRITE, and CONTOUR.

3.2 Command Options, Parameters, and Prompts

COMMAND OPTIONS OFFER ALTERNATIVE COURSES OF ACTION: Each command in MOSS represents a capability that can be used to process map data. The user executes a command by typing the name of the command followed by options or parameters that are associated with the command. An "option" represents an alternative course of action that the user can take when executing a command. For example, the STATISTICS command has three options: CROSSTABS, HISTOGRAM, and DESCRIBE. In order to execute a command, the user must specify the desired option.

COMMAND PARAMETERS SPECIFY VALUE OR NAME: While an option allows the user to choose a course of action, a parameter is a particular value or name that a user must provide. For example, to list the subject contained in a particular map, the user must provide the name of the map. Similarly, to display a map, the user must specify the ID number of the map from the active table.

COMMAND PROMPTING: MOSS has been designed to prompt the user for the options and parameters associated with a command. The user simply has to type in the name of the command; MOSS will then query the user for both options and parameters that are required. For example:

```
 ENTER COMMAND
? DISTANCE
 ENTER AIRLINE OR PATH
? AIRLINE
 POINT TO TWO LOCATIONS
```

In the above example, MOSS prompted the user to specify a particular option of the DISTANCE command.

All of the MOSS commands have been designed to provide the capability to override some or all of the prompting message. For example:

```
 ENTER COMMAND
? DISTANCE AIRLINE
 POINT TO TWO LOCATIONS
```

In the above example, both the command and the option were specified on a single line; one less step was required to execute the command

3.3 General Syntax Rules for Entering MOSS Commands

SYNTAX RULES: Only a few syntax rules or conventions regulate the use of MOSS commands. The following section discusses the more general syntax rules that apply to the MOSS commands. The user should consult Sections 5-9, for rules and limitations that are specific to each command.

QUESTION MARK:

1) Input can only be provided after a question mark (?) has appeared.

```
ENTER COMMAND
? LOCATE
```

In the above example, the command was typed in after the question mark.

SPELLING:

2) All commands and command options must be spelled exactly as indicated in the user's manual before they will execute. Misspellings will result in an error message.

ONE BLANK ONLY:

3) When all the input parameters or options are entered on one line, each must be separated by one and only one blank.

For example:

```
ENTER COMMAND
? PLOT 1 2 4
```

Note that only one blank separates each of the active table ID numbers: " 1 2 4".

ACTIVE ID:

4) All active maps are referenced by the ID number indicated in the active map table.

NAME LENGTHS:

5) The name of any map in MOSS cannot exceed ten characters.

CORRECTION INPUT:

6) The user may cancel a line that has been entered by entering a control U (Press the CNTL and U keys on the terminal at the same time). Individual characters may be deleted by pressing the rubout key for each letter. These changes can only be performed prior to the user hitting the return key.

COMMAND TERMINATION:

7) The user may terminate a command by entering the following sequence: CNTL C CNTL B. By pressing the Control C Control B keys the user terminates the current command. When entering the termination sequence above the user will either completely end the MOSS session and be returned to the AOS CLI or a command process will stop and the ENTER prompt will appear on the screen. If the MOSS session is terminated, the user must enter MOSS again and enter RESTART as the user name asked for by MOSS.

4.0 DETAILED DESCRIPTION OF MOSS COMMANDS

COMMAND DESCRIPTION: Previous explanations and examples of the MOSS commands have been general and incomplete, designed to introduce readers to the logic, structure, and capabilities of MOSS. This section of the User's Manual describes each MOSS command in detail. Section 4.1 provides a summary list and general description of the commands. This section is meant to serve as a ready reference to each command's capabilities and to aid users in selecting the commands most suitable for a given problem.

Section 4.2 explains the conventions that were adopted to describe each command. Sections 5, 6, 7, 8, and 9 describe each command in detail in terms of its capabilities, format, parameters, options, and limitations. Examples appear liberally throughout the section.

Individually, each MOSS command offers a powerful capability to process digital map data. However, the full potential of MOSS can only be realized after the user understands (1) the full capabilities and limitations of each command, and (2) the added or synergistic capability that can be achieved by sequencing complementary commands. This portion illustrates in detail the basic capabilities of MOSS. However, many of the commands are difficult to describe in an isolated manner. Only through frequent use and experimentation will the user realize the full potential of MOSS.

4.1 Summary List of Commands by Group

COMMAND SUMMARY: Table 4.1.A lists and describes the MOSS commands by group: (1) general purpose; (2) data base management; (3) spatial retrieval; (4) analysis, and (5) display. The section is intended to provided users with a quick and ready reference to each command's basic capabilties. Each command is described in more detail in Section 5, 6, 7, 8, and 9 in alphabetical order within groups.

4.2 MOSS Command Writeup Conventions

Several conventions were adopted for documenting each command. These include:

1) Commands are arranged alphabetically within grops.

2) Each command is described in four parts:

   a) Narrative Summary of the Command's Capabilities
   b) Command Format, Parameters, and Options
   c) Examples of the Command
   d) Limitations of the Command

3) All commands and command options are written in CAPITAL LETTERS.

4) All command parameters are enclosed between parentheses ( ) and written in lower case letters, for example (map name). Here, the user would not type "map name", but rather the name of a particular map such as WANTELOP. The parentheses are not typed.

5) Brackets [ ] are used to identify command options that are logically related. Select only one of the options when executing the command. For example, the format of the DISTANCE command id described as:

```
           [AIRLINE]
DISTANCE      [PATH]
```

To execute the PATH option, type:

```
DISTANCE PATH
```

To execute the AIRLINE option, type:

```
DISTANCE AIRLINE
```

Several command options require the user to respond with a simple YES or NO. These options are also identified in brackets with a brief description of the results that will be archieved by responding YES or NO. For example:

```
[YES -- display]
[NO -- no display]
```

A YES response will display the resulting output from the command; typing NO will suppress the display. Only the word YES or NO is typed; i.e., do not type: "YES -- display" or "NO -- no display".

6) An asterisk* above any command option or parameter indicates that MOSS will always prompt the user for the parameter or option, i.e., the user cannot override the prompting message. For example the format for one option of the SELECT command is:

```
                   [ATTRIBUTE]
SELECT (map name)  [SUBJECT] (search string)*
                   [ITEM]
```

The asterisk above (search string) indicates the MOSS will always prompt the user for the search string. For example,

```
 ENTER COMMAND
?  SELECT WANTELOP SUBJECT
 ENTER SUBJECT SEARCH STRING  ?  CRITICAL
 NUMBER OF HITS = 48
```

Command DETAILS: Section 5, 6, 7, 8, and 9 describe each MOSS command in terms of its general capabilities, format, parameters, options, and limitations. These command descriptions are independent of any specific computer hardware.

5.0 GENERAL PURPOSE COMMANDS

5.1 AUDIT Command

1. Narrative Summary of the Command's Capabilities

AUDIT is a data base command that displays a table showing for each item in a map the subject item number, perimeter in miles, area in acres, number of islands, and number of coordinate pairs.

2. Command Format, Parameters, and Option

a. Format

AUDIT (map name)

b. Parameters/Options

(map name) -- the name of the map that the user wishes to examine.

3. Examples of the Command

Figure 5.1.A is an example of the use of the AUDIT command on a map.

4. Limitations of the Command

a. Does not work for cell maps.

5.2 COST Command

1. Narrative Summary of the Command's Capabilties

COST is a general purpose command that provides a breakdown of the usage of MOSS. This breakdown provides the following information up to the point when the COST command is issued: total computer time used (CPU time) in seconds; the number of records transferred from mass storage, and the total cost of the run.

2. Command Format, Parameters, and Options

a. Format

COST

b. Parameters/Options

None

3. Examples of the Command

The following example illustrates the use of the COST command to determine how much a particular run has cost up to the time the COST command was issued.

```
 ENTER COMMAND
?  COST
 TOTAL TIME     =  4.35
 TOTAL RECORDS   =  24381
 TOTAL JOB COST  =  1.07
 ENTER COMMAND
?
```

4. Limitations of the Command

The COST command must be changed whenever the host computer's system charging algorithm changes.

5.3 FINISH Command

1. Narrative Summary of the Command's Capabilities

FINISH is a general purpose command that will terminate the MOSS program. After this command is initiated, the user is returned to the computer operating system. The user can then initiate other programs, dispose maps to the line printer, or other storage devices through the CRT or type the word BYE and log off the computer operating system.

2. Command Format, Parameters, and Options

a. Format

```
FINISH
```

b. Parameters/Options

None

3. Examples of the Command

The following example illustrates the use of the FINISH command to terminate a MOSS run:

```
 ENTER COMMAND
?  FINISH

 MOSS    SESSION FINISHED
```

5.4 HELP Command

1. Narrative Summary of the Command's Capabilities

HELP is a general purpose command that provides either (1) a listing of the MOSS commands, or (2) a general description of the capabilities of a specific command.

2. Command Format, Parameters, and Options

a. Format

```
HELP

-or-

HELP (command name)
```

b. Parameters/Options

(command name) -- The name of the command about which to obtain more information.

3. Examples of the Command

Figure 5.4.A is an example of the output obtained from the HELP command.

5.5 LOCATE Command

1. Narrative Summary of the Command's Capabilities

The LOCATE command determines the Universal Transverse Mercator (UTM) coordinates of any point on the map being displayed on the graphics display terminal (CRT).

2. Command Format, Parameters, and Options

a. Format

LOCATE (crosshair input)*

b. Parameters/Options

(crosshair input)*	— The user points with the cursor to the point for which coordinates are desired.

* — These parameters can only be entered in the prompted mode.

5.6 NEWS Command

1. Narrative Summary of the Command's Capabilities

NEWS is a general purpose command that provides the user with news on the latest changes and additions to MOSS.

2. Command Format, Parameters, and Options

a. Format

NEWS

b. Parameters/Options

None

3. Examples of the Command

The following example illustrates the use of NEWS in supplying the user with information concerning recent changes in MOSS.

```
 ENTER COMMAND
? NEWS
 ENTER COMMAND
?
 THERE HAVE BEEN THREE MAJOR ADDITIONS TO THE SYSTEM IN THE LAST MONTH.
 THESE ARE THE ABILITY TO DELETE MAPS IN YOUR WORKFILES, THE ABILITY TO
 CONTOUR A GRID OF ANY DIMENSION, AND THE ABILITY TO ADD DATA FROM PSU
 DATABASE.  THE KEYWORDS OF INTEREST ARE
        DELETE
        CONTOUR
 THESE COMMANDS ARE DESCRIBED IN GREATER DETAIL UNDER THE HELP COMMAND
```

4. Limitations of the Command

None

5.7 QUERY Command

1. Narrative Summary of the Command's Capabilities

The QUERY command identifies the map, subject, and item of any point, line polygon, or cell being displayed on the graphics display terminal (CRT). In addition, QUERY displays the acreage of any polygon or the length of any line. Polygons, lines, points, and cells are identified by the user with the crosshairs on the terminal.

2. Command Format, Parameters, and Options

a. Format

QUERY (crosshair input)*

b. Parameters/Options

(crosshair input)* — The user points with the cursor to the feature for which information is desired.

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

This is a typical Query sequence

a. a map was plotted: (PLOT)

b. The QUERY command was issued.

c. The crosshairs then appeared on the CRT.

d. The crosshairs were moved to the item of interest.

e. A character on the terminal keyboard (i.e., A, B, C, etc.) was pressed.

f. MOSS responds by summarizing the characteristic of the items identified by the crosshairs.

4. Limitations of the Command

QUERY can only be used to identify the last map ID that was plotted or shaded or the last map for which the LEGEND command was issued. If any commands are issued between the command that plotted the map (i.e., PLOT, SHADE) and the Query command, the QUERY command will respond: NO ITEM FOUND. TRY AGAIN. In this case, the user should replot the map of interest and then issue the QUERY command.

6.0 ACTIVE COMMAND

1. Narrative Summary of the Command's Capabilities

The ACTIVE command produces a table that numbers and describes the active map data. This table is used to monitor data that have been activated.

2. Command Format, Parameters, and Options

a. Format

ACTIVE

b. Parameters/Options

None

3. Examples of the Command

ACTIVE is used frequently throughout a MOSS session to monitor maps that have been (1) activated from the master file and workfile, and (2) synthesized by other MOSS commands. Only maps referenced in the active table can be analyzed or displayed. An active map table is produced when the following command is issued:

```
 ENTER COMMAND
?  ACTIVE
```

4. Limitations of the Command

a. Cannot have more than 43 maps active at one time.

b. Does not display active map subjects.

6.1 ADD Command

1. Narrative Summary of the Command Capabilities

ADD is a data base management command which provides for the addition of maps to a MOSS master data base.

2. Command Format, Parameters, and Options

a. Format

```
ADD(Input file) (name)*    (date)*          (study area)*

(description)*             (vintage)*       (projection)*

[NO-Not OK]                (subjects)*      [YES--OK]
```

[NO--No Update]   [YES--Update]   (data type)*

b. Parameters/Options

(input file)* -- data is either point, line, polygon, or elevation

(map name)* -- the name to be used for this map when it is added to the data base.

(name)* — name of the digitizer

(date)* -- data digitized

(study area)* — study are in which map is located

(description)* -- 60 characters or less description of map

(vintage)* — year of original map data

(projection)* -- coordinate system map is represented in (i.e., UTM, Polyconic, etc.)

[YES--OK]
[NO-Not OK] -- The above information will be displayed and the user will be able to check it for accuracy. If the information is incorrect, the user will be returned to the beginning. Enter the digitizer's name.

[YES--Update]
[NO--No Update] — If the map name already exists in the data base, the user will be asked if this is an update. If not, the map name must be re-entered.

(data type)* -- data is either point, line, polygon, or elevation

* — These parameters can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

a. Cell data cannot be added.

b. Maps with more than 1000 unique primary subjects cannot be added.

c. No more than 2000 maps can be to a master data base file.

6.2 ARCHIVE Command

1. Narrative Summary of the Command's Capabilities

The ARCHIVE command provides the user with the capability of archiving maps to tape and removing the data files from disk. This is helpful in reducing the amount of storage space used on the computer.

2. Command Format, Parameters, and Options

a. Format

```
ARCHIVE

) ARCHIVE (map name)* (tape name)*
```

b. Parameters/Options

(map name)* -- the name of the map to be archived

(tape name)* — the name of the tape on which the archived map will be placed

* — These parameters can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

None

6.3 COMPRESS Command

1. Narrative Summary of the Command's Capabilities

COMPRESS is a data base command that creates a bit map from multi value raster data. The data type for the bit map is 8.

2. Command Format, Parameters, and Options

a. Format

```
COMPRESS (active I.D.) (map name)*
```

b. Parameters/Options

(active I.D.) -- An active cell map.

(map name)* — The name of the map resulting from this process

3. Examples of the Command

None

4. Limitations of the Command

a. Cell map must be used.

b. Map must be active

6.4 DEARCHIVE Command

1. Narrative Summary of the Command's Capabilities

The DEARCHIVE command provides the user with a capability of retrieving archived data files from computer tape. The command works in conjunction with ARCHIVE and LIST ARCHIVE.

2. Command Format, Parameters, and Options

a. Format

DEARCHIVE

```
) DEARCHIVE (map name)*
```

b. Parameters/Options

(map name)* -- the name of the map to be dearchived

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

None.

4. Limitations of the Command

Recommended that LIST ARCHIVE be executed prior to atempting to DEARCHIVE any map.

6.5 DELETE Command

1. Narrative Summary of the Commands Capabilities

DELETE is a data base management command that allows the user to delete maps out of the master data base, or the polygon and cell workfiles. The user is permitted to delete maps out of the master only by knowing the password. This command should be used with extreme caution.

2. Command Format, Parameters, and Options

a. Format

```
                         [MASTER]
DELETE (map name)        [POLYGON]    (password)*
                         [CELL]
```

b. Parameters/Options

(map name) -- name of the map that is to be deleted

[MASTER]
[POLYGON] -- data base location of the map to be deleted
[CELL]

(password)* -- if the map to be deleted is a master database map, the user will be asked for the password

* This parameter can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

Because of the structure of the MOSS data base the user may not be able to delete certain maps. The user will be notified if deletion of a map is not possible.

6.6 FREE Command

1. Narrative Summary of the Command's Capabilities

FREE is a data base command that "deactivates" any map referenced in the active map table.

2. Command Format, Parameters, and Options

a. Format

FREE (active ID's)

FREE ALL

b. Parameters/Options

(active ID's) -- the ID number(s) of the map(s) to be i.e. deactivated or deleted from the active table.

All -- free all active maps

3. Limitations of the Command

None

6.7 LIST Command

1. Narrative Summary of the Command's Capabilities

The LIST command is available to browse the contents of MOSS map files. The command functions much the way that subject/author/title card catalog serves a library user.

The LIST command performs four basic tasks:

a. Lists the names of the maps stored in the master file, the user's cell workfile and polygon workfile.

b. Lists the header or subjects for a particular map in a MOSS map file.

c. Lists map (map name).

d. Browses attribute data base (see Appendix F).

The information provided by the LIST command is often a precursor to using the SELECT command successfully.

2. Command Format, Parameters, and Options

a. Format

```
LIST MAPS

   or

LIST MAPS (search string)

   or
                         [HEADER]
LIST (map name)          [SUBJECTS]
                         [ATTRIBUTES]
```

b. Parameters/Options

MAPS -- produce a list of the names of the maps stored in the master file or user's workfile

LIST MAPS (Search String -- this option allows the user to list only these map names that contain those characters specified in the search string a search string has the form +n or n+ or +n+

(map name) -- the name of a map in the master file (e.g., WANTELOP)

[SUBJECTS] -- prints out the subjects for a particular map in the master file

[ATTRIBUTES] — this option lets the user browse through the associated attributes data base for particular keys or value sets (see ATTRIBUTE Data Base Appendix F)

3. Examples of the Command

A common use of the LIST command is to obtain a printout of the names of the maps in the master file or workfile. For example:

```
 ENTER COMMAND
?  LIST MAPS
 MASTER MAP FILES ARE:

     TAKEFTBN FLOODFTBN  VEGETFTBN  DAMSFTBN
```

This list constitutes all the maps that are stored in a particular master file and workfile.

The remaining options of the LIST command an be used to browse the contents of any of the 'master file' maps listed above. For example, the command:

```
 ENTER COMMAND
?  LIST VEGETFTBN HEADER
```

Lists the source, original scale, vintage, digitizing specification, and other characteristics of this map. To list all the subjects in a map, use:

```
 ENTER COMMAND
?  LIST
 ENTER:  MAPS OR A  <MAP NAME>
?  VEGETFTBN
 ENTER SUBJECTS, ATTRIBUTES, OR HEADER
?  SUBJECTS
```

The associated attributes data base may be browsed using the ATTRIBUTES option of the LIST command.

4. Limitations of the Command

Cannot store or list more than 1000 discrete subjects per map or more than 200 associated attributes per feature in a map.

6.8 MERGE Command

1. Narrative Summary of the Command's Capabilities

MERGE is a data base management command that allows the user to combine several active maps. For example, several county soil survey maps digitized as individual maps an be combined into one map by using the MERGE command

2. Command Format, Parameters, and Options

a. Format

MERGE (active ID's) (new name) (60 character or less descriptor)

b. Parameters/Options

(active ID's) -- the ID numbers of two or more polygon maps referenced in the active map table.

(new name) — the name of the new map created by merging two or more existing maps.

(60 Characters) — a short description of this new map.

3. Limitations of the Command

a. Maps from different themes should be merged with caution, for example, a soil map with a vegetation map of the same geographic area. There will be areas that overlap, thereby not making any sense.

b. The resulting map is stored in the polygon workfile and must be activated by using the SELECT command.

c. No more than 16,000 points, features lines, or polygons in a map.

d. No edge dissolve between maps is provided as a result of the MERGE command.

e. No more than 22 maps may be merged in one pass.

6.9 OPEN Command

1. Narrative Summary of the Command's Capabilities

OPEN is a data base management command that permits the user to open an alternative project data base.

2. Command Format, Parameters, and Options

a. Format

OPEN (name)*

b. Parameters/Options

(name)* — the name of the alternate data base

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

When working with maps that cover a large area, the user may wish to break the maps up, forming smaller groups which pertain to different areas. In doing this, the user must open the appropriate data base for access to each area of interest.

4. Limitations of the Command

None

6.10 POLYCELL Command

1. Narrative Summary of the Command's Capabilities

POLYCELL is a data base command that allows the user to convert point, line, or polygon maps to raster maps. Raster data are used in the STATISTICS, COMPOSITE, CELLPLOT, THREED, SHADE, AREA, LIST CELLVERS and QUERY Commands. There are several questions that will require decisions to be made before POLYCELL can be executed. One is the cell size. The cell size is given in acres and is used to calculate the number of rows and columns in the cell matrix. The cell size can affect several functions. These are (1) the length of processing; (2) the wait-time at the terminal, and (3) the accuracy of the results. It is suggested that the command TESTGRID be used to help the user select an appropriate cell size. Another important question to be answered is how the user wishes to assign descriptor codes to the cells.

2. Command Format, Parameters, Options

a. Format

POLYCELL (active ID) (study area name)*

(description of new map)* (cell size)*

(cell size ratio)* (new name)*

(description of map cell map)* — A user-defind description of the new cell map. Description is 60 characters or less

(cell size) — Cell size of the new cell map. This is user-specified in acres.

(cell size ration)* — The Y/X ratio of each cell on the new cell map. Ration for a line printer of 8 lines per inch is 1.25 and for DEM data 1.0.

(new name)* — new map name

* — These parameters can only be entered in a prompted mode.

3. Limitations of the Command

a. If the resulting map is to be overlaid on or composited with other maps (see COMPOSITE command section), the user must use the same cell size for all maps.

b. When polygons are converted to cells, each cell will be assigned the value of the polygon occupying the majority of the area of that cell.

6.11 REPORT Command

1. Narrative Summary of the Command's Capabilities

REPORT is a data base command that uses the associated attributes data base to generate reports of between one and six columns of information. This type of function is termed REPORT GENERATION. To use this command properly, the user should have a good knowledge of how to use the associated attributes data base.

2. Command Format, Parameters, and Options

a. Format

```
REPORT (active ID) (column designators)*
```

b. Parameters/Options

(active ID) -- the ID number of the map referenced in the active map table.

(Column designators) -- the attributes for this map that the user wishes to be the columns in the report table.

3. Limitations of Command.

a. no more than six columns.

6.12 SAVE Command

1. Narrative Summary of the Command's Capabilities

The SAVE command is used to save any point, line, or polygon map referenced in the active map table as part of the user's workfile.

Once a map has been saved, it can be accessed in subsequent MOSS sessions. This capability eliminates the time and expense of having to recreate maps that will be used repetitively over a period of time.

2. Command Format, Parameters, and Options

a. Format

SAVE (active ID) (new map name)

b. Parameters/Options

(active ID)	--	The ID number of map referenced in the active map table.
(new map name)	--	A name that identifies the map being saved.

3. Examples of the Command

Prompted and unprompted versions of the SAVE command are available. The format for the unprompted version is:

```
 ENTER COMMAND
?  SAVE 3 CONFLICT
 NUMBER OF DATA ITEMX TO BE SAVED = 14
```

In the above example, active map ID 3 was saved as part of the user's workfile and given the name CONFLICT. The same result could be achieved by using the prompted version:

```
 ENTER COMMAND
?  SAVE
 ENTER ACTIVE DATA SET ID TO SAVE
?  3
 WHAT DO YOU WISH TO CALL THE NEW MAP?
 NUMBER OF DATA ITEMS TO BE SAVED = 14
```

4. Limitations of the Command

a. Only one active map can be saved at one time.
b. Only 2000 maps can be stored in a workfile.

6.13 SELECT Command

1. Narrative Summary of the Command's Capabilities

The SELECT command is used to activate all or a specific portion of a map that is stored in a map file. The results of the SELECT command (i.e., active data) are referenced in the active map table.

2. Command Format, Parameters, and Options

a. Format

```
                            [ATTRIBUTE]
SELECT (map name)           [SUBJECT]      (search string)*
                            [ITEM]

SELECT (map name)  ALL
```

b. Parameters/Options

[ATTRIBUTE] [SUBJECT] [ITEM] — Specifies that a subject, item, or attribute string from a map stored in a map file will be used as a criterion for selection.

ALL — Activates all the items associated with a map stored in a map file (only SELECT option allowed on raster data)

(map name) — The name of map stored in the master file or workfile to be activated.

(search string)* — A string of characters (e.g., 2ABDCE, WINTER, etc.) that identifies the specific subject/item or combination of subjects that a user wishes to activate from a master file map.

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

Prompted and unprompted versions of the SELECT command are available to activate maps stored in a master, cell or polygon workfile.

Below, the unprompted version of SELECT is used to activate a polygon workfile map named JOHNPOL.

```
?  ENTER COMMAND
 SELECT JOHNPOL    ALL
 NUMBER OF HITS = 21
```

The number of hits refers to the number of points, lines, or polygons contained on the map named JOHNPOL.

The procedure for activating based on subject is basically the same as above. For example:

```
 ENTER COMMAND
?  SELECT VEGETFTBN SUBJECT
 ENTER SUBJECT SEARCH STRING?   VI
 NUMBER OF HITS = 10
```

The above command introduces the concept of a search string. It is only necessary to specify enough characters to differentiate the subject(s) of interest from other subjects. For example, suppose the object was to activate only "FARMSTEAD". This could be accomplished by specifying "FS" or "FARMSTEAD" or "FS FARM" or any other string of characters that would differentiate farmstead from the other subjects.

The last SELECT option allows the user to activate data based on the contents of the associated attributes file for the map of interest. This option is especially suited to handling such attribute data as census data and timber harvest data

4. Limitations of the Command

a. Cannot activate any map with more than 32,767 points, features, lines, or polygons.

b. Cannot select on the basis of subject from a cell workfile.

6.14 STATUS Command

1. Narrative Summary of the Command's Capabilities

STATUS is a data base management command that computes and prints out the number of items and coordinates pairs for (1) all the maps in the master file, or (2) a particular map in the master file or user's workfile. This information produced by STATUS provides an index to the volume of data associated with a particular file or map.

2. Command Format, Parameters, and Options

a. Format

```
STATUS DATA BASE

 or

STATUS (map name)
```

b. Parameters/Options

(map name)	--	the name of a map in the master file or user's workfile.
DATABASE	--	produces a summary of the number of entries (subjects) and items in all the maps in the master file.

3. Examples of the Command

STATUS is used primarily by data base managers to determine the volume of data associated with a particular file or map. The size of any master file data base is determined with the following command:

```
ENTER COMMAND
STATUS DATABASE
NUMBER OF MAPS IN MASTER DATABASE = 138
NUMBER OF MAPS IN CELL WORKFILE =     5
NUMBER OF MAPS IN POLYGON WORKFILE = 14
```

The size of a particular map stored in the master file can be determined:

```
ENTER COMMAND
STATUS
ENTER:  DATABASE OR A MAPNAME
THEGPSWSCT
   INFORMATION FOR MAP   THEGPSWSCT
STATUS OF MAP          = ON DISK
DATA TYPE              = POLYGON
NUMBER OF ITEMS        = 131
NUMBER OF COORDINATES  = 10332
```

In the above command, the unprompted version of STATUS was used to determine the number of entries (items) and coordinates pairs associated with the THEGPSWSCT map. These data are useful for estimating the complexity, storage cost, and analysis cost for any map.

4. Limitations of the Command

Cannot do status on active maps.

6.15 STUDYAREA Command

1. Narrative Summary of the Command's Capabiliteis

STUDYAREA is a data base management command that constructs a new boundary around any map or series of maps referenced in the active map table. The boundary of the new study area is specified with the crosshairs on the Tektronix terminal. The new study boundary acts as a retrieval envelope on active maps that are specified. Active map data falling within the new study area boundary are saved as part of a polygon workfile; active data that cross the new study area boundary are "clipped," and the portions inside the new study area are also saved in the workfile. Separate output maps are produced and saved for each active map that is put in.

The STUDYAREA command is useful for stratifying an area based on geographical locations. For example, in an aquatic investigation, the capability to stratify a river into reaches and conduct separate evaluations of each reach could be desirable. The STUDYAREA command could be used to define and create separate data bases for each reach of the river that is specified by the user.

STUDYAREA is also useful for developing an independent data base for a subunit of a large study area. For example, the maps in a particular master file or workfile may geographically encompass the entire state of Wyoming. If a user were only interested in a particular portion of the state, the STUDYAREA command could be employed to create a new map data base for the particular area of interest. This new, more restricted data base could be recalled in subsequent MOSS sessions and unwanted data covering the remainder of the state avoided.

2. Command Format, Parameters, and Options

a. Format

```
STUDYAREA (active ID's)
```

b. Parameters/Options

(active ID's) — the ID numbers of one or more maps referenced in the active map table.

(crosshair input)* -- designates the boundary of the study area (from 3 to 250 points are allowable).

T* -- terminates the study area boundary input after specification of the boundary with the cursor.

(map names)*	—	the name of the new maps corresponding to each active map specified as (active ID's) above.

* — These parameters can only be entered in a prompted mode.

3. Limitations of the Command

a. STUDYAREA does not work on cell data.

b. A maximum of 20 active ID's can be specified.

c. Study area boundary must be entered in clockwise order.

7.0 CONTIGUITY Command

1. Narrative Summary of the Command's Capabilities

CONTIGUITY is a spatial retrieval command that allows the user to answer the question: "What is next to what?" For example, the user may have a vegetation map and wants to know how many polygons of ponderosa pine are adjacent to polygons of douglas fir. The result of using CONTIGUITY would be a new map of all ponderosa pine and douglas fir polygons that are adjacent to each other. The resultant new map is a new active data see (See ACTIVE Command). If the user wants to save the new map as part of his workfile, he can use the SAVE command (See SAVE command).

2. Command Format, Parameters, and Options

a. Format

CONTIGUITY (active ID) (active ID) (new name)
(contiguity tolerance)

b. Parameters/Options

(active ID) -- the ID number of a polygon map reference in the active map table.

(map name) -- the name for the map resulting from CONTIGUITY

(contiguity tolerance)--the contiguity range in miles that active ID 1 must be from active ID 2.

3. Limitations of the Command

a. Polygons are considered contiguous if one digitized point from active ID 2 is within the contiguity tolerance of a polygon in ID 1.

b. This command works only on polygon data, not lines or points.

c. Window must be set.

d. Misuse of the tolerance parameter can cause erroneous results.

7.1 EDGE Command

1. Narrative Summary of the Command's Capabilities

EDGE is a spatial retrieval command that computes the edges or common boundaries shared by subjects associated with two or more maps referenced in the active map table. A typical use of EDGE is to activate the common boundaries between different surface cover types. For example, EDGE could be used to activate all the common boundaries or edges between a riparian vegetation type and irrigated cropland. The result of the EDGE command is a line map that contains the common boundaries shared by the input maps. The length of the lines in the EDGE map can be calculated with the LENGTH command.

2. Command Format, Parameters, and Options

a. Format

```
EDGE (active ID's) (tolerance)
```

b. Parameters/Options

(active ID's) — the ID number of two or more maps referenced in the active table (polygon maps only)

(tolerance) — the maximum distance in miles that two edges or boundaries can be separated and still be considered as a common boundary. The tolerance factor increases as the minimum polygon size and accuracy of the data increases.

3. Examples of the Command

EDGE is used to activate the common boundaries shared by two or more active maps. The following command sequence activates all possible combinations of edges shared by juniper (ID 1), deciduous streambank vegetation (ID 2), and sagebrush vegetation types (ID 3).

```
 ENTER COMMAND
?  EDGE
 ENTER TWO OR MORE ACTIVE DATA SET ID'S
?  1  2  3
 ENTER EDGE TOLERANCE IN MILES (NON-ZERO)
?  .05
   5 EDGES FOUND BETWEEN 1.5 JUNIPE AND 1.2 DECIDU
 177 EDGES FOUND BETWEEN 1.5 JUNIPE AND SAGE
  19 EDGES FOUND BETWEEN 1.2 DECIDU AND SAGE
```

The result of this command is a new map containing (1) 5 edges between juniper and deciduous streambank, (2) 177 edges between juniper and sage, and (3) 19 edges between sage and deciduous streambank. Each of the combinations is identified as a unique subject on the new map RJSEDGE.

4. Limitations of the Command

a. Maps used must be polygon, not lines, points, or cell.

b. A maximum of 20 input maps can be compared for EDGE.

c. Edges are determined if a minimum of two points from ID 1 are within a tolerance of ID 2.

d. Window must be set.

e. The tolerance must not be abused or poor results may occur (.001 is good).

f. Only one subject per active map.

7.2 PROXIMITY Command

1. Narrative Summary of the Command's Capabilities

PROXIMITY is a spatial retrieval command that activates data from a map based on its proximity to some point or other map feature. Typical instructions that can be completed using the PROXIMITY command include:

a. Find all the high-use antelope winter range that are within .5 miles of any mine site.

b. Find all the proposed strip mines within 5 miles of point X (where point X is identified by the user).

PROXIMITY uses an active map(s) as input and produces a new active maps as output.

2. Command Format, Parameters, and Options

a. Format

PROXIMITY (active ID1) (active ID2) (distance) (map name)

or

PROXIMITY (active ID) (distance) (crosshair input)*

b. Parameters/Options

(active ID1) — the ID number of a map in the active table that will the origin of the search; mine sites for examples 1.

(active ID2) — the ID number of a map in the active table that will be the object of the search. The resultant map will be some set of polygons from ID2.

3. Limitations of the Command

a. Distance (tolerance) must be greater than 0.

b. Window must be set.

c. Input maps must be active.

7.3 SIZE Command

1. Narrative Summary of the Command's Capabilties

SIZE is a spatial retrieval command that activates polygons or lines in an active map based on the size or length of the polygons or lines on the map. For example, SIZE might be used to activate coal deposits between 5,000 and 10,000 acres in size from an energy resources map. The SIZE command uses an active map as input and produces a new active map as output.

2. Command Format, Parameters, and Options

a. Format

```
SIZE (active ID)    POLYGON* (minpol)*    (maxpol)*
```

or

```
SIZE (active ID)    LINE* (minline)*    (maxline)*
```

b. Parameters/Options

(active ID) — the ID number of a map referenced in the active table

POLYGON* — specifies that a polygon map will be used

LINE* — specifies that a line map (e.g., a road map) will be used

(minpol)* — minimum size of the polygon to be activated, in acres

(maxpol)* — maximum size of the polygon to be activated, in miles

(minline)* — minimum length of the line to be activated, in miles

(maxline)* — maximum length of the line to be activated, in miles

* — These parameters can only be entered in a prompted mode.

3. The following command demonstrates the use of the SIZE command to activate big sage/grassland polygons between 50 acres and 100 acres in size.

```
          ENTER COMMAND
        ?   SIZE 1 POLYGON 50  100
          NUMBER HITS = 6
          ACTIVE SET ID = 3
          ITEMS BELOW RANGE = 25
          ITEMS ABOVE RANGE =  4
```

The prompted version of that command appears as follows:

```
          ENTER COMMAND
        ?   SIZE
          ENTER ACTIVE MAP ID'S
        ?   1
          LINE OR POLYGON DATA SET?
        ?   PQLYGON
          ENTER MINIMUM POLYGON SIZE (IN ACRES)
        ?   50
          ENTER MAXIMUM POLYGON SIZE (IN ACRES)
        ?   100
          NUMBER HITS = 6
          ACTIVE SET ID = 3
          ITEMS BELOW RANGE = 25
          ITEMS ABOVE RANGE =  4
```

4. Limitations of the Command

   a. Window must be set

   b. Cannot use cell data

   c. Input data must be active.

8.0 ANALYSIS COMMANDS

8.1 AREA Command

1. Narrative Summary of the Command's Capabilities

AREA is an analysis command that produces a table of the area, frequency, and percentage of each subject associated with any polygon map referenced in the active map table. The area is calculated in acres.

2. Command Format, Parameters, and Options

a. Format

AREA (active ID)

b. Parameter

(active ID) -- the ID number of a polygon map referenced in the active map table which is to be analyzed.

3. Examples of the Command

The area of the subjects associated with any polygon map referenced in the active map table can be calculated with the AREA command. For example:

```
 ENTER COMMAND
?  AREA 3
```

4. Limitations of the Command

a. Input map must be active.

b. Cannot have more than 800 unique subjects in a map.

c. If area is greater than 9,999,999. acres or frequency is greater than 99999., ASTERISKS will be printed out.

8.2 BUFFER Command

1. Narrative Summary of the Command's Capabilities

BUFFER is a analysis command that draws a buffer (i.e., a zone of influence) of user-specified size around any map data referenced in the active map table. BUFFER will draw zones of influence around points (e.g., a ferret sighting), lines (e.g., road), or polygons (e.g., a city). The result of the BUFFER command is a polygon map that is saved as part of the user's workfile. If you are going to use a large buffer size, it is suggested that you execute the WEED funtion on the map first.

2. Command Format, Parameters, and Options

a. Format

```
BUFFER (active ID)  (new map)  (Radius)
```

b. Parameters/Options

(active ID) -- the ID number of a map referenced in the active map table

(new name) -- the name for the map resulting from the BUFFER

(radius)* -- the width or radius of the buffer zone

3. Limitations of the Command

a. Buffer may produce erroneous results on "dirty" data; i.e.; lines with duplicate points or selfcrossing loops.

b. Zones of very large size, relative to the scale the user is working at, can produce erroneous results. The user should use the WEED command to avoid these erroneous results.

c. Resulting buffered areas will have no more than 2000 points per polygon.

d. Input map must be active.

e. Input maps must have less than 1000 points per polygon or line.

8.3 COMPOSITE Command

1. Narrative Summary of the Command's Capabilities

COMPOSITE is an analysis command that allows the user to do Boolean and algabraic manipulations of data from one or more raster maps.

The LOGICAL option to manipulate maps is extremely versatile. This command option can handle any mixture of data levels — nominal (discrete), ordinal, or interval. The essential LOGICAL comparison operators are: GT (greater than); LT (less than); EQ (equal to); NE (not equal to); GE (greater than or equal to); connecting operators are OR and AND. The result of combining data with the COMPOSITE (LOGIÇAL) command is a new map. Because this command only composites cell data, the new map is also a cell map.

The ARITHMETIC option to manipulate maps is also important for many types of quantifiable suitability analyses. This command assigns a numberic weight to each map and computs a total score for each cell across multiple maps. A typical example of an ARITHMETIC composite may be

result = 2.5 X SOILS - 3.2 X VEGETATION.

The valid operators between maps include +, -, ./., and X. Up to 20 unique maps can be entered into an ARITHMETIC composite equation. Both input and output maps are cellular. Entry of criteria specifiation is terminated by entering END for both logical and ARITHMETIC.

2. Command Format, Parameters, and Options

a. Format

```
                                 [ARITHMETIC]
COMPOSITE (active ID)  [ARITHMETIC] (study area name]

(description of new map)* (new map name)* (number of criteria)*

(new description for each criterion)*

LOGICAL Criteria Specification

(map name)*   (relation)*  (code)*   (connector)*

(map name)*   (relation)*  (code)*   (connector)*
     .             .           .           .
     .             .           .           .
     .             .           .           .
END

(replacement symbol)*

ARITHMETIC Criteria Specification
```

```
(map ID)*   (operator)*   (weight)*
    .            .            .
    .            .            .
    .            .            .
END
```

b. Parameters/Options

(active ID)	-- the ID number of cell map referenced in the map table.
[LOGICAL] [ARITHMETIC]	-- the user has the option of doing either a LOGICAL or ARITHMETIC COMPOSITE. LOGICAL is discussed in this section.
(study area name)*	-- a user-defined 10-character-or-less study area name.
(description of new map)*	-- the user must enter a 60-character-or-less description of the new map.
(new map name)*	-- the user gives the map a new name of 10 character or less.
(number of criteria)*	-- the number of logical "if" statements the user wishes to use when creating a new map based on LOGICAL compositing.
(map ID)*	-- the ID of any active map
(relation)*	-- less than (LT); greater than (GT); equal to (EQ); and NE (not equal to).
(code)*	-- the code representing a subject being tested.
(replacement symbol)*	-- a code which will be placed in a cell which successfully meets the previously specified criterion.
(weight)*	-- decimal weight ranging from 0.00 to 999.9.
(operator)*	-- plus (+), minus (-), division (/), multiplication (*).

* -- These parameters can only be used in the prompted mode.

3. Examples of the Command

The following is an example of the prompts and a typical user's response for creating a LOGICAL COMPOSITE map:

```
   COMPOSITE 1  2
   ENTER LOGICAL OR ARITHMETIC
?  LOGICAL
   ENTER STUDY AREA NAME
?  SETA
   ENTER 60 CHARACTER OR LESS DESCRIPTION
?  ANTELOPE RANGE VERSUS COAL MINING IMPACT MAP
   WHAT DO YOU WISH TO CALL THE NEW MAP?
?  AIMPACK
   ENTER NUMBER OF CRITERIA
?  2
```

After specifying the above parameters and options, the user is prompted with:

```
  ENTER CRITERION #1
  ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
```

A typical user's response is as follows:

```
?  WENERGY EQ 1
   ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
?  WANTELOP GT 5
   ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
?  END
   ENTER REPLACEMENT SYMBOL
?  1

   ENTER CRITERION #2
   ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
?  WENERGY EQ 3 OR
   ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
?  WENERGY EQ 4
   ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
?  WANTELOP LE 5
   ENTER MAP NAME, RELATION, PRESENT CODE, AND CONNECTOR
?  END
   ENTER REPLACEMENT SYMBOL
?  2
```

Note: To end a criterion, the user simply types END.

Following the last entry of either LOGICAL or ARITHMETIC criteria, the user will be prompted for BINARY, SUBJECT, or RECODE. The user should enter RECODE and enter a 30 character or less subject and ID number for each criterion to be placed in the new composited map.

4. Limitations of the Command

a. Works only on cell data.

b. If the user makes a mistake when entering a LOGICAL criterion, he must finish entering all phrases of that criterion before he can start over.

c. Maps to composite must be active.

d. Total number of cells in each map must be equal.

e. No more than 20 maps may be composited in one pass.

f. No more than 1024 columns allowed in a cell map.

g. No more than 30 criteria.

h. No more than 70 relations.

8.4 DISTANCE Command

1. Narrative summary of the Command's Capabilities

DISTANCE is an analysis command that measures the distance in miles and kilometers between any two points on the CRT, either along a straight line or along a path, such as a road or a stream. The beginning and end points of the DISTANCE measurement are identified using the crosshairs (cursor) on the graphics display terminal.

2. Command Format, Parameters, and Options

a. Format

```
         [AIRLINE]
DISTANCE [PATH]    (crosshair input)*  (crosshair input)*
```

b. Parameters/Options

[AIRLINE] [PATH]	-- measures (1) the AIRLINE distance (as crow flies) between any two points identified on the CRT, or (2) the distance between any two points along a PATH that is displayed on the CRT. The distance is calculated in miles and kilometers.
(crosshair input)*	-- the user points with the cursor to the beginning and end points of the measurement.

* — This parameter can only be entered in a prompted mode.

3. Limitations of the Command

a. Window must be set.

b. Cannot use cell data.

c. When using DISTANCE PATH on line data, the shortest route between disjoint lines is not found.

d. If the PATH option is used and more than one possible path choice exists between the source and destination points, the distance should be determined from node to node or, from path decision point to path decision point.

8.5 FREQUENCY Command

1. Narrative Summary of the Command's Capabilities

FREQUENCY is an analysis command that produces a table showing the frequency and percentage of each subject contained on any map referenced in the active map table. Specifically, FREQUENCY shows the number and frequency of the points, lines, polygons associated with a particular subject on a map.

2. Command Format, Parameters, and Options

a. Format

```
FREQUENCY (active ID)
```

b. Parameters/Options

(active ID) -- the ID number of any map referenced in the active map table.

3. Examples of the Command

The frequency and percentage of the subjects contained in any active point, line, or polygon map can be determined with the FREQUENCY command. For example:

```
   ENTER COMMAND
?  FREQUENCY 1
```

produces a frequency table.

8.6 GRID Command

1. Narrative Summary of the Command's Capabilities

This command performs point-to-grid interpolation. A sparse matrix of (X,Y,Z) triples is interpolated to an (X,Y) complete matrix in which each (X,Y) element contains an interpolated (Z) value. The result is saved as a user-named cell workfile. These regular grid maps produced by the GRID command can be used as input for the CONTOUR, SLOPE, ASPECT, THREED, QUERY, PROFILE, COMPOSITE, SHADE, and LIST commands. The user should be aware that the distribution of data on the map which GRID is being used to GRID is critical. If the user is not sure of the map he is going to use in GRID, a system analyst should be contacted. This command is usually used to convert point samples, such as rainfall, to a complete matrix of values.

2. Command Format, Parameters, and Options

a. Format

```
GRID (active ID)       (new map name)
(study area name)*     (description of map)*     (cell size)*
```

b. Parameters/Options

(active ID) — the ID number of a point map referenced in the active map table.

(new map name) — the name for the new map resulting from GRID.

(description) — 60 characters or less description of the new map.

(cell size)* — the user must enter the number of acres that will be in each cell.

* — These parameters can only be entered in a promoted mode.

3. Examples of the Command

The following is an example of the parameters and options needed to grid an elevation map (active ID 1). The resulting map is stored in the cell workfile.

```
   ENTER COMMAND
?  GRID 1
   WHAT DO YOU WISH TO CALL THE NEW MAP?
?  ELEV
   NO. ROWS = 26 NO. COLS = 30
?  ENTER STUDY AREA NAME
?  LETA
   ENTER 60 CHARACTER OR LESS DESCRIPTION
?  LETA ELEVATIONS
   ENTER CELL SIZE IN ACRES
?  5
```

4. Limitations of the Command

a. GRID is limited by the distribution of elevation data. A systems analyst should be contacted if the user is not familiar with the use of GRID.

b. Window must be set.

8.7 LENGTH Command

1. Narrative Summary of the Command's Capabilities

LENGTH is an analysis command that produces a table showing the length, frequency, and percent of each subject associated with any line map referenced in the active map table. The length is summarized in miles.

2. Command Format, Parameters, and Options

a. Format

```
LENGTH (active ID)
```

b. Parameters/Options

(active ID) -- the ID number of a line map referenced in the active map table.

3. Examples of the Command

The length of the subjects contained on any line map referenced in the active map table can be calculated with the LENGTH command. For example:

```
   ENTER COMMAND
?  LENGTH 4
```

4. Limitations of the Command

a. Input map must be active.

b. Cannot use cell data.

c. If length is greater then 9999999.99 miles, only asterisks will print out.

d. Cannot have more than 1000 unique subjects in the input map.

8.8 LPOVER Command

1. Narrative Summary of the Command's Capabilities

LPOVER is an analysis command that synthesizes a new map by determining the logical intersection between a polygon map and a line map. The two maps are referenced in the active map table.

2. Command Format, Parameters, and Options

a. Format

```
LPOVER (ID1 ID2)  (map name)*

[YES           --  override default subject merge]*

[NO            --  default subject]

(starting word)* -- (number of characters)*
```

b. Parameters/Options

ID1 ID2) — ID1 is a polygon map and ID2 is a line map.

(map name) — the name of the map resulting from LPOVER.

[YES--override default [NO--use combined subjects]* — the user may specify what part of the subjects from each map will be used as the new map subject.

(starting word)* — the first word to be used in the new map subject from the subjects of the two maps.

(number of characters)* — the number of characters that are to be included in the subject.

* — These parameters can be entered only in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

a. Cannot have more than 1000 unique subjects in a map.

b. Window must be set.

c. Both maps must be active.

8.9 OVERLAY Command

1. Narrative Summary of the Command's Capabilities

The OVERLAY command synthesizes a new map be determining the logical interseciton between two polygon maps referenced in the active map table.

2. Command Format, Parameters, and Options

a. Format

```
OVERLAY (ID1 ID2) (map name)* [YES--override default subject merge]*
                              [NO--default subject]

(starting word)*   (number of characters)*
```

b. Parameters/Options

(ID1 ID2)	-- the ID numbers (ID1 and ID2) of the two polygon maps to be overlaid referenced in the active map table.
(map name)*	-- the name of the map resulting from OVERLAY.
[YES--override default]* [NO--use combined subjects]	-- the user may specify what part of the subjects from each map will be used as the new map subject.
(starting word)*	-- the first word to be used in the new map subject from the subjects of the two maps.
(number of characters)*	-- the number of characters that are to be included in the subject.

* -- These parameters can only be entered in a prompted mode.

3. Examples of the Command

Any two maps (both must be polygon) can be combined using the OVERLAY command. The following command illustrates the OVERLAY COMMAND:

```
   ENTER COMMAND
?  OVERLAY
   ENTER ACTIVE DATA SET ID'S
?  1  2
   WHAT DO YOU WISH TO CALL THE NEW MAP?
?  COMMITCT
   DO YOU WISH TO OVERRIDE DEFAULT SUBJECT MERGE?
?  NO
   INTERSECTED POLYGONS = 128
```

4. Limitations of the Command

a. Line or point map will not be processed (See LPOVER)

b. Cannot have more than 800 unique subjects in a map.

c. Window must be set.

d. Both maps must be active.

8.10 PERIMETER Command

1. Narrative Summary of the Command's Capabiliteis

PERIMETER is a data analysis command that produces on the user's console a summary table of length, frequency, and percent of the perimeter for each subject in a map.

2. Command Format, Parameters, and Options

a. Format

PERIMETER (active ID)

b. Parameters/Options

(active ID) — active map for which a perimeter table is desired.

3. Limitations of the Command

a. Can do PERIMETER only on polygon data.

b. Window must be set.

c. No more than 1000 unique subjects in a map allowed.

d. Map must be tive.

8.11 SAMPLE Command

1. Narrative Summary of the Command's Capabilities

SAMPLE is an data analysis command that takes a random sample of all items in a map and produces an active data set excluding the sampled items. The user specifies the number of items out of the map to be sampled.

2. Command Format, Parameters, and Options

a. Format

SAMPLE (active ID) (number of items)*

b. Parameters/Options

(active ID) -- the active ID of the map that will be sampled.

(number of items)* -- the number of items to be sampled out of the map.

(map name)* — the name of the map resulting from SAMPLE

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

a. Cannot sample for more than 1000 items.

b. SAMPLE cannot be used on cell data.

8.12 SPSS Command

1. Narrative Summary of the Command's Capabilities

SPPS is an analysis command that produces a data file that the user can then save and use for later analysis with a statistical package or input into ESRI grid processing software. The package does not necessarily have to be SPSS. Only cell data is used.

2. Command Format, Parameters, and Options

a. Format

```
SPSS (active map 1)  (active map 2)  (active map n)
```

b. Parameters/Options

(active map ID's) -- the ID number of a cell map referenced in the active map table.

3. Examples of the Command

No examples are necessary for this command. It simply creates an external data file to be used by an external statistical package or the ESRI grid software.

4. Limitations

Maps must be active.

8.13 STATISTICS CROSSTABS Command

1. Narrative Summary of the Command's Capabilities

STATISTICS CROSSTABS is an analysis command that produces a two-way frequency table of the contents of two cell maps referenced in the active map table.

For each element in the above table, STATISTICS CROSSTABS computes for statistics:

a. The cell count; the number of cells that were coded as subject A1 and B1, subject A1 and subject B2, etc.

b. The total percent, or the percentage that cell count is of the total number of cells in the study area (i.e., count/total cell count X 100).

c. The row percent, or the percentage that the cell count is of the row cell count.

d. The column percent, or the percentage that the cell count is of the column cell count.

2. Command Format, Parameters, and Options

a. Format

STATISTICS (ID1 ID2) CROSSTABS

b. Parameters/Options

(ID1 ID2)	--	the ID numbers of two cell maps referenced in the active map table.
CROSSTABS	--	produces a two-way frequency table of the contents of two cell maps (ID1 and ID2).

3. Examples of the Command

None

4. Limitations of the Command

a. Cell maps only.

b. Window must be set.

c. Maps must be active.

d. No more than 1600 unique combinations.

8.14 STATISTICS DESCRIBE Command

1. Narrative Summary of the Command's Capabilities

STATISTICS DESCRIBE is an analysis command that produces summary statistics for any polygon or line map referenced in the active map table. Specifically, for each subject associated with a map, the command computes: (1) the minimum area or length; and (2) the maximum area or length; (3) the total area or length; and (4 the range, mean, variance, and standard deviation. This command emulates the DESCRIBE subprogram in the Statistical Package for the Social Sciences (SPSS).

2. Command Format, Parameters, and Options

a. Format

STATISTICS (active ID) DESCRIBE (YES - ready)

b. Parameters/Options

(active ID)	--	the ID number of a line or polygon map referenced in the active map table.
(DESCRIBE)	--	produces summary statistics for each subject in the active map specified.
(YES - ready)*	--	the user has made a hard copy and is ready to go to the next page.

* -- This parameter can only be entered in a prompted mode.

3. Examples of the Command

DESCRIBE is available to statistically summarized any active line or polygon map. The following example demonstrates the use of DESCRIBE to summarize a polygon map containing one subject.

```
    ENTER COMMAND

?   STATISTICS 1 DESCRIBE

    DESCRIPTIVE STATISTICS FOR 2.1 BIG SAGE-GRASSLAND
    TOTAL CASES =        35 OUT OF     =        133
    MIN VALUE   =        .9 MAX VALUE  =        164.5
    RANGE       =       169 MEAN       =        36.8
    STAN. DEVE. =      45.6 VARIANCE   =      .398363E+4
    TOTAL             1693. DATA TYPE           POLYGON
    READY ?
?   Y
```

In the above example, the following statistics were generatd for the subject "2.1 Big Sage - Grassland:

a. Total cases ____ out of ____

This indicates the number of items (cases) in the active map specified (i.e., 133), and the actual number that were analyzed. In the above example, of the 133 cases, a total of 35 are considered in the computation of the descriptive statistics.

b. Min value, Max Value, and Range

The Min Value and Max Value denote the smallest and largest length of area, while the Range is the Min Value subtracted from the Max Value.

c. Mean

Often referred to as the "average", the Mean is merely the sum of each polygon's area or line's length for each case, divided by the Total Cases.

d. Variance

Variance is a measure of dispersion of the data about the Mean. This statistic is one way of measuring how closely the individual values of the variable cluster around the Mean. The Variance will be small when there is a great deal of homogeneity in the polygon's area or lines' length, for then most cases will,have very small deviations from the Mean. Variances are printed out in an "E" format, meaning that the decimal point is moved to the left (-) or to the right (+) the number of places indicated by the numbr following the letter "E". In the above example the value .2083651E+04 could also have been expressed as 2,083.41.

e. Standard Deviation

Standard Diviation is another measure of the dispersion about the Mean. Very simply, it is the square root of the Variance. The advantage of the Standard Deviation is that it has a more intuitive meaning, being based on the same unit as the original variable. In the above example, the Variance is 1083 acres. The Standard Deviation is 45.6 acres^2, which means that 66 percent of the observations fall with 1SD of the mean, where 1SD equals 45.6 acres.

f. Total

The Total refers to the total line length in miles or polygon area in acres of the total cases.

g. Data Type

Data Type is defined as either "polygon" or "line". DESCRIBE does not compute statistics for point data. Whenever the Data Type is identified as "polygon", the acreage of the cases will be

described. On the other hand, when the Data Type is "line", the length of the cases (in miles) will be described.

4. Limitations of the Command

a. A separate table is produced for each subject in a map. Maps with a large number of subjects can take a very long time to print out. (The only way to stop the printing once it has started is to terminate MOSS — i.e., type CNTL B, CNTL C.

b. Descriptive statistics are only computed when the total number or cases is 3 or greater.

c. STATISTICS DESCRIBE was not designed to work on point or cell data.

d. Map must be active.

8.15 STATISTICS HISTOGRAM

1. Narrative Summary of the Command's Capabilities

STATISTICS HISTOGRAM is an analysis command that produces a bar graph or histogram of the frequency distribution of the subjects in any active map. Either cell or polygon maps can be used as input.

2. Command Format, Parameters, and Options

a. Format

```
STATISTICS (active ID)  HISTOGRAM (YES - ready)*
```

b. Parameters/Options

(active ID)	--	the ID number of a map referenced in the active map table.
HISTOGRAM	--	produces a histogram of the frequency of the subjects in any map.
(YES - ready)*	--	erases the screen and causes the legend for the histogram to be produced.

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

STATISTICS HISTOGRAM graphically describes the frequency distribution of the subjects in any active map. A separate legend is produced that identifies by name each of the subjects represented on the histogram. The command:

```
   ENTER COMMAND
?  STATISTICS 1 HISTOGRAM
```

4. Limitations of the Command

a. Map must be active.

b. No more than 64 unique subjects.

8.16 WEED Command

1. Narrative Summary of the Command's Capabilities

The WEED command allows the user to remove unneeded points from a line or polygon. This is a process called "line generalization". The basic algorithm used takes two points, calculates a corridor of infinite length parallel to the line segment, and removes points from the line until a point falls outside the corridor. When this occurs, two new points are taken from the line, and the process is repeated.

2. Command Format, Parameters, and Options

a. Format

```
WEED (MAPID) (new map name) [TOLERANCE]
```

b. Parameters/Options

(MAPID) -- active map ID of the map to generalize.

(new map name) -- what the user wish to call the new map that will be stored in with the polygon workfile.

[TOLERANCE] -- Generalizations tolerance (in meters). This is the width of the generalization corridor.

3. Examples of the Command

The following is an example showing the input and output from the WEED command:

```
ENTER COMMAND

WEED 1

WHAT DO YOU WISH TO CALL THE NEW MAP?

TESTWEED

NUMBER OF DATA ITEMS TO BE SAVED = 4

ENTER WEEDING TOLERANCE IN METERS 30
```

4. Limitations of the Command

a. Window must be set.

9.0 DISPLAY COMMANDS

9.1 ASPECT Command

1. Narrative Summary of the Command's Capabilities

ASPECT is an analysis display command which provides the user with a method of showing the aspect of elevation data. The command produces a new map which contains a matrix of cells assigned a value dependent upon their aspect. The value are asigned acordingly:

1
8 2
7 3
6 4
5

2. Command Format, Parameters, and Options

a. Format

ASPECT (active ID) (map name) (description)*

b. Parameters/Options

(active ID)	-- active ID of the map that is the subject of ASPECT.
(map name)	-- the name of the map in which the results of the command are to be placed.
(description)*	-- 60 character or less description of the new map.

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

a. ASPECT can only be performed on an elevation cell matrix map.

b. Map must be active.

9.2 BLOWUP Command

1. Narrative Summary of the Command's Capabilities

BLOWUP is a display command that allows the user to magnify a portion of the display window specified by the WINDOW command. The user should display a map on the screen for orientation. The area to be magnified is indicated by pointing to two diagonal corners of a rectangle that bounds the new area ofinterest. Pointing is done with the CRT crosshair.

2. Command Format, Parameters, and Options

a. Format

```
BLOWUP (crosshair input)* (cross hair input)*
```

b. Parameters/Options

(crosshair input)* — the user points with the cursor to the opposite diagonal corners of the new viewing rectangle.

* — This parameter can only be entered in a prompted mode.

3. Limitations of the Command

a. The BLOWUP area is rectilinear.

b. Any map displayed on the screen after the BLOWUP will only be shown within the magnified area.

c. Beware of zooming in past the resolution of the data.

d. Window must be set.

e. BLOWUP does not "physically" clip polygons or lines that cross thenew viewing window. The STUDYAREA command should be used before the AREA or LENGTH commands to insure accurate computations.

9.3 CALCOMP Command

1. Narrative Summary of the Command's Capabilities

See Separate CALCOMP Manual.

9.4 CELLPLOT Command

1. Narrative Summary of the Command's Capabilities.

CELLPLOT is a display command generates a shaded raster map from cell data. The cell map is plotted on the Calcomp plotter.

2. Command Format, Parameters, and Options

a. Format

CELLPLOT (active ID) (map scale)* (display range)*

[0 — not same shade for all levels [0] [0 — don't plot polygon borders]*

[1 — same shade for all levels] [1 — plot polygon borders]

b. Parameters/Options

(active ID)	—	The ID number of an active cell map
(map scale)	—	The scale 1:X at which the CELLPLOT is to be drawn. Default is 1:24,000.
(display range)	—	the user specifies the levels to be displayed.
[0 — not same shade] [1 — same shade	—	the user specifies how the display levels should be shaded.
[0 — no polygon borders plotted] [1 — polygon borders plotted]	—	the user specifies if polygon borders will be included in the plot.

* — These parameters can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

a. Cell map must be used.

b. Map must be active.

c. Window must be set.

9.4.1 CELLVERS Command

1. Narrative Summary of the Command Capabilities

CELLVERS is a display command that generates a shaded raster map on a Versatec plotter from cell data. The user must enter the CLI mode to utilize this command.

2. Command Format, Parameters, and Options

CELLVERS (active ID) (map scale)* (display range)*

[0 — not same shade for all levels]* [0--don't plot polygon borders]*

[1 — same shade for 11 levels] [1— plot polygon boarders]

b. Parameters/Options

(active ID) — the ID number of an active cell map.

(map scale) — the scale 1: at which the cell plot is to be drawn. Default is 1:24,000.

(display range) — the user specifies the levels to be displayed.

[0 — not same shade] [1 — same shade] — the user specifies how the display levels should be shaded.

[0 — no polygon borders plotted [1 — polygon borders plotter] — the user specifies if polygon boarders will be included in the plot.

* — These parameters can only be entered in a prompted mode.

3. Limitations of the Command

a. Cell map must be used.

b. Map must be active.

c. The CELLVERS command must be entered in the CLI mode.

9.5 CONTOUR Command

1. Narrative Summary of the Command's Capabilities

CONTOUR is a display command that genrates a contour map from a grid of elevations. The grid surface of elevations can be created by use of the GRID command.

2. Command Format, Parameters, and Options

a. Format

CONTOUR (active ID) (map name)* (data points-final fit)*

(data points-preliminary fit)*

[0 — no labeling]* minimum altitude)*

[1 — labeling]

[maximum altitude)* (contour increment)*

(Y - extent)*

b. Parameters and Options

(active ID)	—	the ID number of a polygon map referenced in the active map table.
(map name)	—	user defined name for the DTM to contour.
(data points-final fit)	—	user must specify the number of data points along a boundary of a preliminary fit.
(data points-preliminary	—	user must specify the number of data points along a boundary of a preliminary fit.
[0 — no labeling] [1 — labeling]	—	user must type in 0 for no labeling or 1 for labeling.
(minimum altitude)	—	user must specify the minimum altitude to be contoured.
(contour increment)	—	user must specify the contour increment
(Y - extent)	—	user must specify the Y - extent of the data on the plotter in inches.

* — These parameters can only be entered in a prompted mode.

3. Limitations of the Command

a. Only uses digital elevation models.

b. Window must be set.

c. No more than 50 contour intervals allowed.

d. Depressions are not marked.

e. Map must be active.

9.6 ERASE Command

1. Narrative Summary of the Command's Capabilities

ERASE is a display command that clears the display screen and sets the cursor in the upper left-hand corner of the screen. This command should be used liberally if the user wishes to keep the display screen readable.

2. Command Format, Parameters, and Options

a. Format

```
ERASE
```

b. Parameters/Options

None

3. Limitations of the Command

None

9.7 LEGEND Command

1. Narrative Summary of the Command's Capabiliteis

LEGEND is a display command tht produces a legend or labels the items for any map referenced in the active map table. The legend contains the map scale, and title. The LEGEND command will also label any point, line, or polygon that is displayed on the CRT.

2. Command Format, Parameters, and Options

a. Format

LEGEND (active ID) DESCRIBE (Title)* (crosshair input)*

or

LEGEND (active ID) [LABEL]

b. Parameters/Options

(active ID) — the ID number of a map referenced in the active map table.

DESCRIBE — produces a map legend with the map scale, north arrow, title, user's name, date, and the description of the map from the active table.

[LABEL] — displays the subject name of each item on the CRT, beginning at the centroid of the line or polygon and moving horizontally.

(title)* — the user supplies the title that will be used in the legend. (60 character or less).

(crosshair input)* — the legend is to be placed.

* — These parameters can only be entered in the prompted mode.

```
  ENTER COMMAND
? LEGEND
  ENTER ACTIVE MAP DATA SET ID'S
? 1
  LABEL OR DESCRIBE?
? DESCRIBE
  TYPE IN TITLE OF THE MAP
? SOILS
  POINT TO CORNERS OF THE LEGEND BORDER
```

3. Limitations of the Command

a. Labels becme cluttered when a large number of items (points, lines, or polygons) are being displayed on the CRT. To minimize cluttering, the character size can be reduced on the Tektronix 4014 or 4016 terminal.

b. Labels run to the next line when the end of a line is encountered.

c. Only one active map ID can be specified in the LEGEND command.

d. Differences in the size of the map displayed on the CRT and the size of the hard copy of the same map result in about a 10 percent error in the map scale.

e. The subject description under LEGEND (LABEL) is limited to 30 characters.

9.8 LINE Command

1. Narrative Summary of Command's Capabilities

LINE is a display command that plots one or more line maps (e.g., a road map) referenced in the active map table on the CRT using one of 30 possible line symbols. The line symbol can either be specified by the user or assigned automatically by MOSS.

2. Command Format, Parameters, and Options

a. Format

```
LINE (active ID's) NO

or

LINE (active ID's) YES   [YES — table]
                         [NO — no table] (symbol ID's)
```

b. Parameters/Options

(active ID's) -- the ID number(s) of a line map(s) referenced in the active map table.

NO -- indicates that the user wishes to have MOSS automatically assign line symbols.

YES -- indicates that the user wishes to assign the line symbols.

[YES -- table]
[NO — no table] -- This option produces a table showing the 30 line symbols: type YES to produce the symbol table; type NO to suppress the production of the table.

(symbol ID's) -- the ID number(s) of the line symbol(s) referenced in the line symbology table. Must have one line ID for each map.

3. Examples of the Command

The LINE command will plot any active line map using one of 30 symbols.

```
   ENTER COMMAND
?  LINE 1 2 3
   DO YOU WISH TO ASSIGN LINE SYMBOLS (YES OR NO)?
?  YES
   DO YOU WISH TO SEE LINE SYMBOLS (YES OR NO)?
?  YES
   LINE SYMBOLOGY TABLE
   ENTER LINE SYMBOLOGY ID'S
?  18   3   10

   ENTER COMMAND
?  LINE  1  2  3  YES   NO  18  3  10
```

In the above command, the YES indicates that the user is going to assigned the symbols; the NO that he does not desire to have the symbol table produced.

At the user's direction, MOSS will automatically assign line symbols.

4. Limitations of the Command

a. No legend is produced identifying the subject or map associated with each symbol.

b. Only one line symbol can be assigned to each map. For example, a transportation map that contains divided and undivided highways can only be displayed with one line symbol. Divided highways cannot be assigned one symbol and undivided highways another symbol.

c. Map must be active.

d. Window must be set.

e. Only 30 line symbologies are available.

9.9 NUMBER Command

1. Narrative Summary of the Command's Capabilities

The NUMBER command is a display function that allows the user to assign integer numbers to sets of polygons or to plot polygon items numbers at the centroid of the polygon. A typical use might be to assign number 1 to all polygons of high suitability for development and 2 to all polygons of low suitbility for development.

2. Command Format, Parameters, and Options

a. Format

```
                [YES]
NUMBER (MAPID)  [NO]    [NUMBERS]
```

b. Parameters/Options

(MAPID) -- active map ID of the map the user wishes to assign numbers to.

[YES]
[NO] -- YES to force writing of certain numbers for map or NO for the program to assign numbers.

[NUMBERS] — if the user answer YES to number assignment, he assigns these numbers to each active map he is processing. (The number of NUMBERS must equal the number of MAPID's)

3. Examples of the Command

Suppose we have map and we wish to assign the number 1 to the centroid of the map. The following execution of the NUMBER command would do this:

```
ENTER COMMAND
NUMBER 2
DO YOU WISH TO ASSIGN VALUE?   (YES OR NO)
NO
```

4. Limitations of the Command

a. No more than 22 maps per execution.

b. Window must be set.

9.10 PLOT Command

1. Narrative Summary of the Command's Capabilities

PLOT is a display command that allows the user to display any active point, line, or polygon map. If points or lines are font assigned, the plot will show point symbols or line symbols.

2. Command Format, Parameters, and Options

a. Format

PLOT (active ID's)

b. Parameters/Options

(active ID's) — the ID number(s) of one or more polygon maps referenced in the active map table.

3. Limitations of the Command

a. Maps must be activated before they can be displayed.

b. A viewing window must be specified using the Window command before a map can be displayed using the Plot command.

c. PLOT does not work on cell or grid data.

d. Cannot plot more than 20 maps with on issue of the Plot Command.

9.11 RESET Command

1. Narrative Summary of the Command's Capabilities

RESET is a display command that allows the user to erase the screen and return the data display to the window specified by using the WINDOW command. The RESET command would usually be executed after doing one or more blowups with the BLOWUP command.

2. Command Format, Parameters, and Options

a. Format

```
RESET
```

b. Parameters/Options

None

3. Examples of the Command

No example is necessary for this command.

9.12 SHADE Command

1. Narrative Summary of the Command's Capabilities

SHADE is a display command that allows the user to shade or cross-hatch active polygon map or cell maps on the CRT screen and shade the maps with differential cross-hatching. If more than one active map ID number is entered following the SHADE command (see command format, below) each map will be plotted with different degrees of cross-hatching. This allows the user to shade to differentiate between map data sets.

2. Command Format, Parameters, and Options

a. Format

SHADE (active ID's)

b. Parameters/Options

(active ID's) — the ID number(s) of one or more polygon maps referenced in the active map table.

3. Limitations of the Command

a. The maximum number of shades that can be done at one time is 10.

b. If SHADE is used at two different times on two different active map ID's, each will be cross-hatched in the same manner.

c. Window must be set.

d. If the users wished to shade a cell map, only one active ID can be entered at a time.

9.13 SLOPE Command

1. Narrative Summary of the Command's Capabilities

SLOPE is an analysis/display command which provides the user with a method of calculating the slope of elevation data. The command produces a new map which contains a matrix of cells assigned a value dependent upon their percent slope.

2. Command Format, Parameters, and Options

a. Format

SLOPE (active ID9) (map name) (description)*

b. Parameters/Options

(active ID) -- active ID of the map that is the subject of SLOPE.

(map name) -- the name of the map in which the results of the command are to be placed.

(description)* -- 60 characters or less description of the new map.

* -- This parameter can only be entered in a prompted mode.

3. Examples of the Command

None

4. Limitations of the Command

a. Only one map can be the object of the SLOPE command at a time.

b. SLOPE can only be performed on an digital elevation model.

c. Cannot get a line printer map of an un-grouped slope map; use the THREED command.

d. Map must be active.

9.14 SYMBOL Command

1. Narrative Summary of the Command's Capabilities

SYMBOL is a display command that allows the user to select one of 30 symbol and have that symbol plotted for point or polygon data (at the polygon centroid).

For example, the user may wish to plot both proposed and active surface mines, both being point data. By using the SYMBOL command, two different symbols can be used for the two different subjects within one map.

2. Command Format, Parameters, and Options

a. Format

```
   SYMBOL (active ID)     [YES -- assign symbols]
                          [ALL -- all subjects one symbol]

                          [YES -- symbols table]
   (symbol assignment)*

   or                     [NO -- no symbol table]

   SYMBOL (active ID)     [NO -- assignment of symbols]
```

b. Parameters/Options

(active ID)	—	the ID number of a polygon map referenced in the active map table.
[YES — assign symbols] [ALL — all subject one symbol]	—	the user can assign a different symbol to each subject in the active ID (type YES) or he can assign one symbol to all the subjects in the active ID (type ALL).
[YES — symbol table] [NO — no symbol table]	—	the user can see a display of all the symbol options by typing YES or NO.

4. Limitations of the Command

a. If SYMBOL is used on polygon data after the BLOWUP command, there may be no symbol on the screen because the centroid of the polygon may be located outside the blowup area.

b. Window must be set.

c. Maps must be active.

d. Only 30 symbols available.

9.15 TESTGRID Command

1. Narrative Summary of the Command's Capabilities

TESTGRID superimposes a cell grid over any map displayed on the graphics display terminal (CRT). The cell size is user-specified in acres. The highth of the cell is 1.25 times the width. TESTGRID is used to determine an appropriate cell size for converting a polygon map to a cell map.

2. Command Format, Parameters, and Options

a. Format

TESTGRID (cell size)*

b. Parameters

(cell size)* — the ara in acres to be covered by each cell.

* — This parameter can only be entered in a prompted mode.

3. Examples of the Command

TESTGRID provides the capability to visually determine the most appropriate cell size for a polygon-to-cell conversion. A maximum of 100 cells in either the X or Y direction can be displayed on the CRT at one time. Consequently, when the specified cell size results in a display that exceeds these limits, MOSS suggests the user either (1) BLOWUP a section of the map, or (2) use a larger cell size.

The map with the highest resolution (i.e., the smaller polygon size) should be used to determine the most appropriate cell size for resolution of polygon size of 5,000 acres, the other, 500 acres. The map with the 500-acre minimum resolution should be used to establish the cell size for the entire analysis.

4. Limitations of the Command

a. The present height-to-width ration is fixed at 1.25 to 1.

b. Window must be set.

c. If more than 100 cells in X or Y, GRID is not displayed.

9.16 THREED Command

1. Narrative Summary of the Command's Capabilities

THREED is a display command that allows the user to create a three-dimensional display for an elevation map.

2. Command Format, Parameters, and Options

a. Format

THREED (active ID) (Y scale factor) (Y rotation value)
(X rotation value)

b. Parameters/Options

(active map ID) — the ID number of a cell map referenced in the active map table.

(Y scale factor) — scale factors for the Y axis.

(Y rotation value) -- rotation about the Y axis in degrees.

(X rotation value) -- rotation about the X axis in degrees.

3. Limitations of the Command

a. Only digital elevation data can be used.

b. Map must be active.

c. Only one map can be the object of the THREED command at a time.

9.17 WINDOW Command

1. Narrative Summary of the Command's Capabilities

WINDOW is a display command that initiates a rectangular window on the map data base. Only those map data that fall within the specified window will be analyzed and displayed. The map data base (X,Y) coordinate information is often referenced to the Universal Transverse Mercator (UTM). Therefore, the window is also in UTM coordinates. UTM coordinates are given in meters from the Equator (Y) and meters from the Equator (Y) and meters from a central meridian (X). The WINDOW command can be used at any time in MOSS to change the viewing window. The WINDOW command must be executed before any activated data or maps (see SELECT command section) can be plotted or displayed (see PLOT command section). There are two forms of the WINDOW command. In the first case the user specifies the exact UTM coordinates of the southwest corner and the number of meters in X and Y for the area of interest. For the second case, the WINDOW is set using an active map as the reference.

2. Command Format, Parameters, and Options

a. Format

WINDOW (SWX cooridnate) (SWY coordinate) (X distance) (Y distance)

or

WINDOW (active ID)

b. Parameters/Options

(SWX coordinate)
(SWX coordinate) -- the UTM easting coordinate at the SW corner of the intended viewing rectangle.

(SWY coordinate) -- the UTM northing coordinate at the SW corner of the intended viewing rectangle.

(X distance) -- the distance in meters from the SW corner to the SE corner of the intended viewing rectangle.

(Y distance) -- the distance in meters from the SW corner to the NW corner of the intended viewing rectangle.

[MAP] -- specifies that the minimum bounding rectangle of a point, line, or polygon map in the active table will be used as the WINDOW.

(active ID) -- the number of the map to be viewed.

3. Examples of the Command

The following examples illustrate the use of the WINDOW command to identify the viewing rectangle for the state of Wyoming using a coordinate system.

Unprompted command option:

```
   ENTER COMMAND
?  WINDOW 200000  4500000  800000  490000
```

Prompted command option:

```
   ENTER COMMAND
?  WINDOW
   ENTER SW X COORDINATE
?  200000
   ENTER SW Y COORDINATE
?  4500000
   ENTER X DISTANCE
?  800000
   ENTER Y DISTANCE
?  490000
```

4. Limitations of the Command

a. Cannot set a zero window.

b. Cannot set a negative window.

9.18 WRITE Command

1. Narrative Summary of the Command's Capabilities

WRITE is a display command that generates a file called LINE.PRINTER for output to devices external to MOSS. This capability allows for generating line printer maps. The following examples are typical uses of the WRITE command:

a. The output of the COMPOSITE and POLYCELL, commands is a cell map. To get a copy of these cell maps, the WRITE command can be used to generate a map on a line printer.

b. WRITE can also be used when a larger-sized map is desired that cannot be produced on the CRT.

2. Command Format, Parameters, and Options

a. Format

```
WRITE (map ID)  [YES -- Versatec output]
                [NO  -- Line printer output]
```

b. Parameters/Options

(map ID) -- the active map ID that is to be written to LINE PRINTER file.

[YES -- Versatec output] -- the user has the option to have the map written to the LINE PRINTER file in 80 or 428 column format.

3. Examples of the Command

One application of the WRITE command is to print the results of a COMPOSITE, POLYCELL, or GRID command on the Line Printer or Versatec printer plotter. The Line Printer will accept 80 column maps, and Versatec will accept 428 column maps. The user by specifying the output device can generate a complete map in the Versatec without having to cut and paste. Following the generation of the LINE.PRINTER file, the user must finish MOSS or use the CLI command, and type in the following sequency of CLI commands.

```
)DISPOSSE LINE.PRINTER
DEVICES PRESENTLY AVAILABLE FOR OUTPUT ARE:
-  TRILOG
-  VERSATEC
   ENTER DEVICE NAME - TRILOG
```

(The user will enter the desired device following the dash above. This should correspond to the output device specified in the WRITE.

4. Limitations of the Command

a. Only cell data can be used.

b. Should not use on elevation or slope cell files (unless recoded using composite).

c. No more than 64 unique cell value allowed. Anything beyond 64 is set to the @ sign.

d. Map must be active.